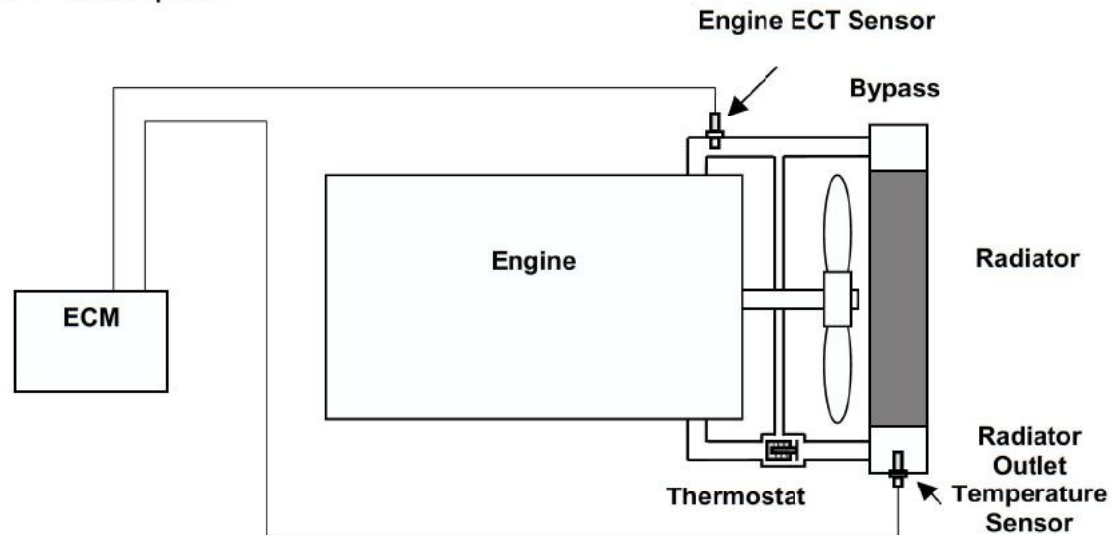


4.8 Thermostat Monitoring

4.8.1 Description



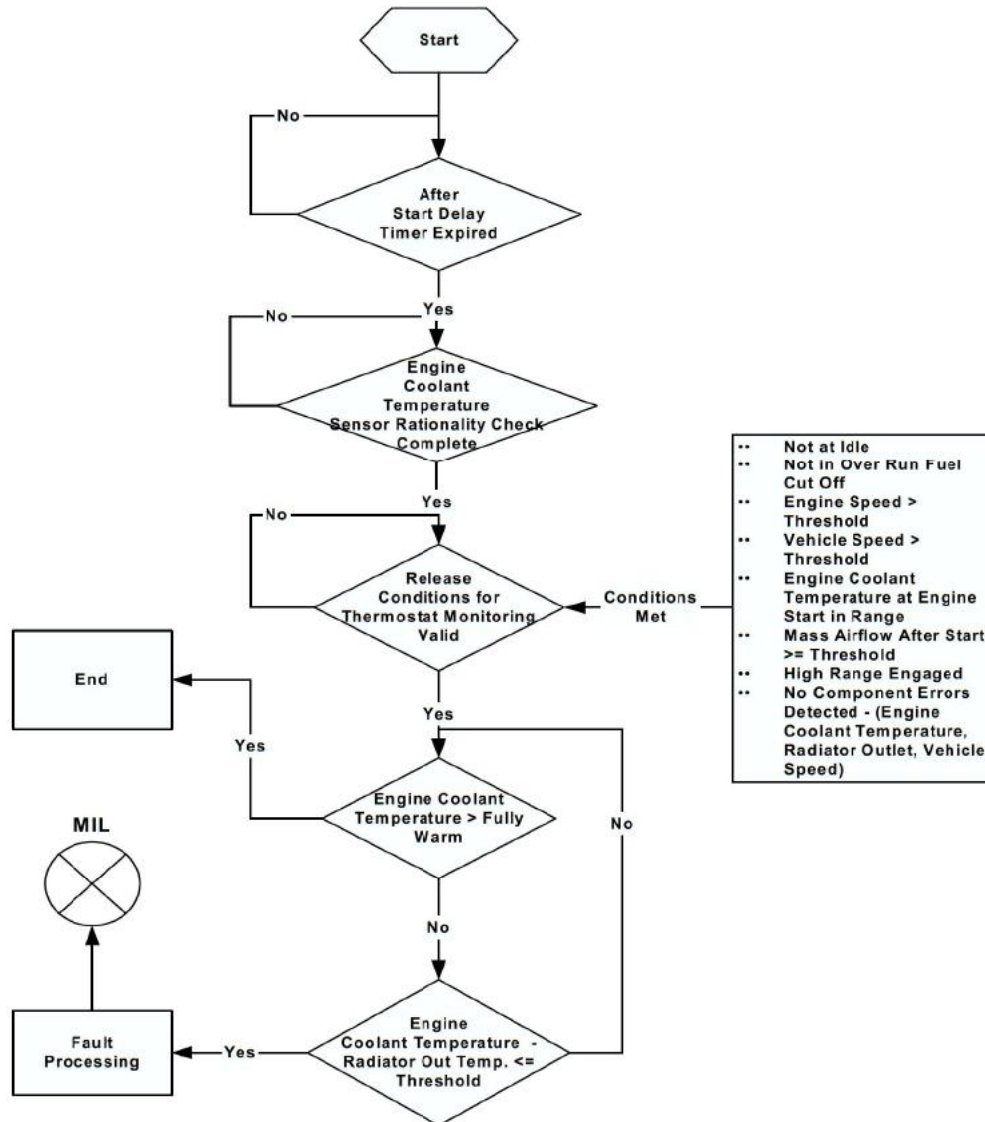
The diagnostic checks for a partially open thermostat, under conditions when the thermostat would be expected to be shut.

A second ECT sensor is installed in the outlet from the radiator. If the enablement criteria are met and the ECT is less than the normal thermostat opening temperature the diagnostic will run.

The diagnostic compares the difference between ECT and the radiator outlet temperature. This gives the temperature drop across the radiator.

If the temperature drop is less than a threshold, and there is flow across the radiator, this is caused by leakage through the thermostat.

4.8.2 Monitoring Structure





Thermostat Monitoring

Component/ System	Fault Codes	Monitoring Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameter	Enable Conditions	Time Required	MIL Illumination	
Thermostat stuck open	P0126	engine not fully warm and temperature drop across the radiator less than a threshold	engine coolant temperature - radiator outlet temperature (TKA)	<ul style="list-style-type: none"> • 45°C @ -10 °C TKA • 40 °C @ 0 °C TKA • 45 °C @ 10 °C TKA • 30 °C @ 20 °C TKA • 30 °C @ 30 °C TKA • 25 °C @ 40 °C TKA • 25 °C @ 50 °C TKA • 25 °C @ 60 °C TKA 	ECT sensor plausibility test ECT time after Start engine Speed vehicle Speed ORFCO engine State airflow after start ECT at start transfer Gears	complete < 81.75 °C > from 220 sec @ 40 °C TKA to 270 sec @ -10 °C TKA > 400 rpm > 15.54 mph not True not Idle • from 3.0 kg @ 40 °C TKA to 10.0 kg @ -10 °C TKA -9.75 °C • start temperature • 81.75°C high Range	1.0 sec/ continuous	two driving cycles	
Radiator Outlet Temperature Sensor	P1118	circuit continuity range check (max)	voltage resistance	> 140.25 °C			1.0 sec/ continuous	two driving cycles	
	P1117	range check (min)		< -33.0 °C	intake air temperature	> -32.25 °C			
Engine Coolant Temperature Sensor High Sided Rationality Check Range Rover Only	P0116	checks for higher than expected engine temperature. Potential fault determined by the Power	<u>power up check</u> engine coolant temperature at start	> ECT at stop - (50.25 x Factor)	radiator outlet temperature at start absolute value of (radiator outlet temperature at start - intake air temperature at start) time after start	< 39.75 °C < 9.75 °C < 2.0 s	7.54 sec/ continuous	two driving cycles	
				intake air temp at start					factor
				-30 °C					0.9961
				-15 °C					0.9727
0 °C	0.9492								



Thermostat Monitoring

Component/ System	Fault Codes	Monitoring Strategy Description	Malfunction Criteria	Threshold Value		Secondary Parameter	Enable Conditions	Time Required	MIL Illumination
		up check at engine start and confirmed by driving check		10 °C	0.9180	radiator outlet temperature at stop ECT at stop transfer gears	> -9.75 °C		
				15 °C	0.8984		> 66.75 °C		
				20 °C	0.8789		high range		
				25 °C	0.8477				
				30 °C	0.8203				
				35 °C	0.8516				
				45 °C	0.7617				
				55 °C	0.6758				
				65 °C	0.3008				
			<u>driving check</u> engine coolant temperature	> 102.0 °C		engine load engine speed calculated ECT vehicle speed time after start intake air temperature radiator outlet temperature transfer gears	2.0 < TL msec < 4.0 1200 < rpm < 2120 • 60.0 °C • 40 km/h > 290 sec • 60 °C • 55.5 °C high range		

If the above table does not include details of the following enabling conditions: - IAT, ECT, vehicle speed range, and time after engine start-up then the state of these parameters has no influence upon the execution of the monitor.